APPENDIX A (FEASIBILITY MODEL)

$$\text{Minimize} \sum_{q \in Q} \sum_{s \in S} \sum_{t \in T(q,s)} b^{+}(q,s,t) - b^{-}(q,s,t)$$

Subject to

$$\sum_{l \in L_{in}(q,s,t)} \delta_l - \sum_{l \in L_{out}(q,s,t)} \delta_l + GroundArc(q,s,\Pr ev(t)) - GroundArc(q,s,t) =$$

$$b^{+}(q,s,t) - b^{-}(q,s,t), \forall (q,s,t) \in Q \times S \times T$$

$$Balance(q,s,t) = b^{+}(q,s,t) - b^{-}(q,s,t), \forall (q,s,t) \in Q \times S \times T$$

Variables

$b^{+}(q,s,t) \geq 0, \forall (q,s,t) \in Q \times S \times T$, INTEGER

$b^{-}(q,s,t) \geq 0, \forall (q,s,t) \in Q \times S \times T$, INTEGER

$Balance(q,s,t)$ INTEGER

GroundArc(q, s, t) $\geq 0, \forall (q,s,t) \in Q \times S \times T$, INTEGER

Parameter/Set	Source	Description
Q	Input from input schedule	Set of all equipment types.
S	Input from input schedule	Set of stations that are or could be operated by host airline.
$T^{QS}(q,s)$	Identified when formulating the feasibility model.	All points in time at which a flight using equipment q can depart from or land at station s.
δ_l	From input schedule.	0/1 indicator: 1, if leg l is flown in the original input schedule; 0 otherwise.

Table 1 Parameters used in Feasibility Model (Appendix A).

Variable	Type	Description
b+(q,s,t)	Integer >= 0	Number of planes of type q that go into service at station s at time t.
b-(q,s,t)	Integer >= 0	Number of planes of type q that are taken out of service at station s at time t.
GroundArc(q,s,t)	Integer >= 0	Number of planes of type q that remain on the ground at station s after the departure/arrival that take place at time t.
Balance(q,s,t)	Integer >= 0	Number of planes of type q that go into service or are taken out of service at station s at time t.

Table 2 Variables used in Feasibility Model (Appendix A).